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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/008,204	12/05/2001	Geeng-Chuan Chern	2102397-991220	2140

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EXAMINER
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GREENE, PERSHELLE L

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 11/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/008,204

Applicant(s)

CHERN ET AL.

Examiner

Pershelle Greene

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 December 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.



**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5. 
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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Serial Number: 10/008204

Attorney's Docket #: 2102397-991220

Filing Date: 12/05/2001

Applicant: Chern et al.

Examiner: Pershelle Greene

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group I, claims 1-14 in Paper No. 7 are acknowledged. It is also noted that applicant cancelled non-elected claims 15-27.

### ***Specification***

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.
3. In the specification on page 7, lines 14-25, reference number 54 is used several times to represent different parts of the device. The reference number 54 is used to represent a poly gate, a control gate, and a floating gate. It is asked that the applicant review the specification to make sure all reference numbers are representing the appropriate pieces of the device.

*Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1-2, and 4-8 are being rejected under 35 U.S.C. 102(e) as being anticipated by Hoang (U. S. Patent # 6,420,753).

As to claim 1, Hoang discloses electrically selectable and alterable memory cells having all of the claimed subject matter:

- A. “a substrate ... and a peripheral area” is met by the substrate 200 of semiconductor material that includes a memory area (right side of 208) and a peripheral area (208 and everything to the left) shown in figure 6;
- B. “an electrically ... from the substrate” is met by the electrically conductive floating gate 204 disposed over and insulated from the substrate 200 shown in figure 6;

- C. “an electrically ... to the floating gate” is met by the electrically conductive control gate 210 disposed adjacent to the floating gate 204 shown in figure 6;
- D. “an insulating layer ... tunneling of charges therethrough” is met by the insulating layer 206 formed in the memory area and peripheral areas that includes a first portion that is disposed between the control gate 210 and the floating gate 204 with a thickness permitting Fowler-Nordheim tunneling of charges. Refer to figure 6 and column 2 lines 4-15;
- E. “an electrically ... from the substrate” is met by the electrically conductive select gate 208, which can be made of polysilicon, disposed over and insulated from the substrate 200. Refer to figure 6 and column 13 lines 33-45;
- F. “a second portion of the insulating layer ... of the insulating layer” is met by the second portion of the insulating layer (206 202) being disposed between the poly gate 208 and the substrate 200 and having a thickness that is greater than that of the first portion of the insulating layer 206 shown in figure 6;
- G. “wherein the first ... a continuous layer of material” is met by the first and second portions of the insulating layer being initially formed as a continuous layer shown in figure 6.

As to claim 2, Hoang shows in figure 6 a source region 214 and a drain region 214 formed in the substrate having a channel region in between. The floating gate 204 is disposed over and insulated from a portion of the channel region.

As to claims 4-6, Hoang shows in figure 6 the control gate 210 having a first portion that is disposed over the floating gate 204. The first portion of the control gate 210 is also disposed

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over a portion of the channel region. The second portion of the control gate 210 is disposed over the floating gate 204.

As to claims 7-8, Hoang shows the device has an insulating layer with a second portion formed directly on the peripheral area of the substrate. The poly gate 208 is formed directly on the second portion of the insulating layer. The first portion of the insulating layer extends between the substrate 200 and the control gate 210.

### *Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3, and 9-14 are being rejected under 35 U.S.C. 103(a) as being unpatentable over Furuhashi et al. (U. S. Patent # 6,429,073).

As to claim 3, claim 3 is being rejected for the same reasons set forth in regard to claim 1. In addition, Furuhashi et al. discloses, in figure 1, a second source and drain region formed in the substrate, with a second channel region in between. The poly gate 30 is disposed over and insulated from at least a portion of the second channel region.

In claims 9-14, Hoang shows, in figure 6, a substrate of semiconductor material having a memory area and a peripheral area. There is a memory cell in the memory area that includes a first source region 214 and a first drain region 214 formed in the substrate having a channel

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region in between. There is an electrically conductive floating gate 204 that is disposed over and insulated from at least a portion of the first channel region. An electrically conductive control gate 210 is disposed adjacent to the floating gate 204. An insulating layer (206 202) is formed in the memory and peripheral area. The insulating layer has a first portion that is disposed between the control gate 210 and the floating gate 204 with a thickness permitting Fowler-Nordheim tunneling of charges. The first and second portions of the insulating layer are initially formed as a continuous layer of material. Hoang fails to explicitly show a second source and drain region.

As to claims 10-12, Hoang shows in figure 6 the control gate 210 having a first portion that is disposed over the floating gate 204. The first portion of the control gate 210 is also disposed over a portion of the channel region. The second portion of the control gate 210 is disposed over the floating gate 204.

As to claims 13-14, Hoang shows the device has an insulating layer with a second portion formed directly on the peripheral area of the substrate. The poly gate 208 is formed directly on the second portion of the insulating layer. The first portion of the insulating layer extends between the substrate 200 and the control gate 210.

Furuhata et al. is cited for showing a method for manufacturing semiconductor devices having a non-volatile memory transistor. Specifically Furuhata discloses, referring to figure 1, a second source 16, drain 14 and channel region. The source 16, drain 14, and channel regions are formed in the substrate 10 with a channel region in between. The electrically conductive poly gate 30 is disposed over and insulated from at least a portion of the second channel region.

It would have been obvious to one of ordinary skill in the art to add the second source, drain, and channel region of Furuhata et al. to the device of Hoang for the purpose of reducing the potential of a noise problem and for better isolation.


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pershelle Greene whose telephone number is 703-305-3870. The examiner can normally be reached on M-F 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 703-308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

PLG  
October 18, 2002

  
**NATHAN J. FLYNN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800**